

**KNOCKING AVOIDANCE CONTROL SYSTEM OF A FOUR-STROKE ENGINE  
FOR AN OUTBOARD MOTOR**

**Abstract of the Disclosure**

**[0158]** An outboard motor includes four-cycle engine for a marine drive, and more particularly a four-cycle engine for a marine drive that has a vertically extending camshaft. The four-cycle engine includes at least one pre-ignition or knock sensor. An electronic control unit adjusts ignition timing and intake camshaft timing to protect the engine during a pre-ignition condition while improving fuel efficiency and preserving high engine output.